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# AMENDMENTS TO THE CLAIMS

1. (currently amended) An optical network comprising:  
one or more than one photonic cells, each of said [[A]] photonic cells cell  
comprising:  
a base node and a plurality of member nodes, each member node within  
optical reach of said from the base node; [[.]]  
optical paths; said optical paths being established based on information of  
said photonic cells.
2. (currently amended) An The optical network as claimed in claim 1 wherein said  
optical reach of said base node is predetermined in a link engineering process the  
base node is within optical reach from at least one of the member nodes.
3. (currently amended) An The optical network as claimed in claim 1 wherein said  
the base node is within optical reach of said base node is determined by input  
parameters selected from a group comprising of: optical route distance; fiber type;  
hut spacing; amplifier gain; transmitter budget; receiver budget; photonic cross-  
connect attenuation; photonic cross-connect hop count; polarization mode  
dispersion; Raman amplifier characteristics; dispersion compensation module  
characteristics; and combination thereof. the plurality of member nodes.
4. (currently amended) An The optical network as claimed in claim 1 wherein said  
optical path is selected based on a number of optical-to-electrical conversions  
each of the plurality of member nodes is a base node for its own photonic cell.
5. (currently amended) An The optical network as claimed in claim 4 wherein said  
number of optical-to-electrical conversions is minimal, comprising: a plurality of  
photonic cells, each cell including a base node and a plurality of member nodes,  
each member node within optical reach from the base node.
6. (currently amended) An The optical network as claimed in claim 1 [[5]] wherein  
said information of said photonic cells are distributed in a routing protocol, each  
photonic cell overlaps at least one node with at least two other photonic cells.
7. (currently amended) An The optical network as claimed in claim 1 [[6]] wherein  
said information of said photonic cells are distributed in a routing protocol, each  
node in an overlap between two photonic cells includes optical regeneration.
8. (cancelled).

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9. (cancelled).
10. (new) A method for determining an optical path through a network, comprising the steps of:
- a) defining a photonic cell of a base node; said photonic cell of said base node comprising nodes within an optical reach of said base node in the network; and
  - b) routing said optical path based on information of said photonic cell.
11. (new) The method as claimed in claim 10, wherein said optical reach of said base node is determined in a link engineering process.
12. (new) The method as claimed in claim 10, wherein said optical reach of said base node is determined by input parameters selected from a group comprising of: optical route distance; fiber type; hut spacing; amplifier gain; transmitter budget; receiver budget; photonic cross-connect attenuation; photonic cross-connect hop count; polarization mode dispersion; Raman amplifier characteristics; dispersion compensation module characteristics and combination thereof.
13. (new) The method as claimed in claim 10, wherein routing of said optical path is based on a number of optical-to-electrical conversions.
14. (new) The method as claimed in claim 13, wherein said number of optical-to-electrical conversions is minimal.
15. (new) The method as claimed in claim 10, further comprising the step of selecting said route through an electrical cross-connect of a second node in said network, said second node having both electrical cross-connect and photonic cross-connect.
16. (new) The method as claimed in claim 10, further comprising the step of forming a membership list of photonic cells based on the optical route.
17. (new) The method as claimed in claim 16, further comprising the step of locating an optical-to-electrical conversion node, said locating step comprising:
- i) Identifying a previous optical-to-electrical conversion node in said membership list;
  - ii) determining photonic cells of said previous optical-to-electrical conversion node; and
  - iii) determining the first node outside said photonic cells of said previous optical-to-electrical conversion node along said optical route as said optical-to-electrical conversion node.
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18. (new) The method as claimed in claim 10, wherein said information of said photonic cells are stored in an centralized database;
19. (new) The method as claimed in claim 10, wherein said information of said photonic cells are distributed in a routing protocol.
20. (new) A computer readable medium storing instructions or statements for use in the execution in a computer of a method for determining an optical path through a network, the method comprising steps of:
  - a) defining a photonic cell of said base node; said photonic cell of said base node comprising nodes within an optical reach of said base node in the network; and
  - b) routing said optical path based on information of said photonic cell.
21. (new) The computer readable medium as claimed in claim 20, wherein said optical reach of said base node is determined in a link engineering process.
22. (new) The computer readable medium as claimed in claim 20, wherein said optical reach of said base node is determined by input parameters selected from a group comprising of: optical route distance; fiber type; hut spacing; amplifier gain; transmitter budget; receiver budget; photonic cross-connect attenuation; photonic cross-connect hop count; polarization mode dispersion; Raman amplifier characteristics; dispersion compensation module characteristics and combination thereof.
23. (new) The computer readable medium as claimed in claim 20, wherein routing of said optical path is based on a number of optical-to-electrical conversions.
24. (new) The computer readable medium as claimed in claim 23, wherein said number of optical-to-electrical conversions is minimal.
25. (new) The computer readable medium as claimed in claim 20, further comprising the step of selecting said route through an electrical cross-connect of a second node in said network, said second node having both electrical cross-connect and photonic cross-connect.
26. (new) The computer readable medium as claimed in claim 20, further comprising the step of forming a membership list of photonic cells based on the optical route.
27. (new) The computer readable medium as claimed in claim 26, further comprising the step of locating an optical-to-electrical conversion node, said locating step comprising:

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- iv) identifying a previous optical-to-electrical conversion node in said membership list;
  - v) determining photonic cells of said previous optical-to-electrical conversion node; and
  - vi) determining the first node outside said photonic cells of said previous optical-to-electrical conversion node along said optical route as said optical-to-electrical conversion node.
28. (new) The computer readable medium as claimed in claim 20, wherein said information of said photonic cells are stored in an centralized database;
29. (new) The computer readable medium as claimed in claim 20, wherein said information of said photonic cells are distributed in a routing protocol.